

VI. *A Letter from Stephen Gray, F. R. S. to Dr. Mortimer, Secr. R. S. containing some Experiments relating to Electricity.*

THE following Lines contain an account of what Electrical Experiments I have made since those I last communicated to the Society which was in *February* last.

February the 18th, I tried what Effect would be produced on several Sorts of Wood with respect to the luminous Part of Electricity : the Wood was made into Rods of the same Form with those Iron Ones mentioned in my former Letter upon this Subject ; the Woods made use of were Fir, Ash and Holly ; these being successively disposed upon Elec-trick Bodies, after the same manner as the Iron Rods had been, the Tube being applied to one End, there appeared a Light on it, but not with so great a Force, nor did the Light extend to so great a length ; neither was the Form of it Conical, but rather Cylindrical ; but the Extremity of it seemed to consist of a short Fringe of Light ; when the Light, that was given to the Rod by the application of the Tube, did cease, upon a motion of my Hand towards the Point of the Rod, the Light came out again, as has been mentioned of the Iron Rods ; but when the Hand or Finger was held near the Point of these wooden Rods, there was no pricking or pushing of the Finger felt, as when the Iron Rods were made use of I had some of these Rods made much bigger at one End than the other, and now applying my Finger to

to the larger End, there not only appeared a Light, but the Finger was pushed, more especially when the Holly Rod was made use of, and the Cheak was a little prick'd, but the Smart was not near so great, as when the Iron Rods were used ; the great End of the Rod was pointed with a much larger Angle than the lesser one, yet there was very little, if any difference, in the form, or bigness of the Light that proceeded from either End.

Having procured me two pair of Lines made of Worsted Yarn, one of them of a Mazareen Blew, the other of a Scarlet Colour ; on the 3d of *April*, I suspended the Boy first on the Blew Lines, and found that all the Effects were the same, as when he was suspended on Lines of Blew Silk. I then suspended him upon the Scarlet Lines, but now though the Tube were as well excited, and the Experiment often repeated, yet there was no Effect produced on him, either of attraction of a pendulous Thread, nor of pricking or burning, by applying one's Hand near him ; I then laid one of the Iron Rods first upon the Blew Lines, and all the same Effects were exhibited, as when the same Rod had been laid on Silk Lines of that Colour ; but upon laying the same Rod upon the Scarlet Lines, no manner of attraction, &c. was perceived.

In the Philosophical Transactions, *Numb. 422.* I gave an Account of the Experiments I made upon the communicative Electricity of Water, and that Water is attracted by the Tube, together with several remarkable Circumstances with which this attraction is attended ; but I have now found, that when the Stand with those little Ivory Cups there

mentioned, be set upon any Electrick Body, the same Phænomena are produced, not only by holding the Tube near the Water, but when that is removed, and the Tip of the Finger placed over the Water, *viz.* there is a little Hill, or Protuberance of Water of a Conical Form, from the Vertex of which proceeded a Light and a small Snapping.

May the 6th, we made the following Experiment. The Boy being suspended on the Silk Lines, and the Tube being applied near his Feet as usual; upon his holding the End of his Finger near a Gentleman's Hand, that stood on a Cake made of Shell Lack and black Rosin; at the same time another Gentleman stood at the other side of the Boy with the pendulous Thread; then the Boy was bid to hold his Finger near the first Gentleman's Hand, upon which it was prick'd, and the snapping Noise was heard; and at the same time, the Thread which was by its attraction going towards the Boy fell back, the Boy having lost a great part of his attraction, upon a second moving his Finger to the Gentleman's Hand, the attraction ceased: then the Thread being held near that Gentleman, he was found to attract very strongly; but having since repeated this Experiment, I find that though the attraction of the Boy is much diminished, yet he does not quite lose it, till 2, 3, and sometimes 4 applications of his Finger to the hand of him that stands on the Electrick Body, but without touching him. At another time I caused three Persons to stand, one of them upon a Cake of Shell Lack, &c. the other upon one of Sulphur, the third upon a Cake of Bees-Wax and Rosin; the Persons all holding Hands, the Boy applying his Finger

Finger near the first Man's Hand, they all three became Electrical, as appeared by the attraction of the Thread, when held near to any of them.

P O S T S C R I P T.

A Repetition of some of these Experiments, and an Addition of some others made June the 10th.

June the 10th in the Morning, I repeated the Experiments with the Wooden Rods, the most material Ones of which were made with the Holly Rod: This being laid on the Glass Cylinder, and a Fir Board about a Foot Square and three tenths of an Inch thick being placed erect upon a Stand, that was set on another Glass Cylinder, so that the Center of the Board was placed near the Point of the Rod, but not to touch it by near half an Inch; then the Tube being held near the great End of the Rod, there issued out a Light from the little End of the Rod, which was that next the Board; and, as the Boy told me, it came along with a hissing Noise, and struck against the Board: When he touched the Board, there was a Light; and, at the same time, another on the End of the Rod, but he heard no snapping nor pricking of his Finger, as when the Brass Plate and Iron Rod were made use of.

Experiments with the Scarlet and Blue Worsted Yarn repeated.

When the Boy was suspended upon the Scarlet Lines, he attracted the white Thread at a very small Distance, but the Attraction ceased in about 6 or 7 Seconds of Time. Then the Boy being taken off, an Iron Rod was laid on the Lines, but there was

no attraction of the Thread by the Body of the Rod ; but when the Thread was held near either of the pointed Ends of it, there was a small Repulsion of it, and in the Dark a very small Light was seen at each End of the Rod.

When the Boy was suspended upon the Blue Lines, he attracted the Thread to him when it was held at least a Foot distance from him, and continued his attraction to near 75 Seconds, the Iron Rod continued its attraction not more than 36 Seconds.

Experiments made in the Afternoon upon the Boy when he was suspended upon Silk Lines of several Colours.

When he was suspended on the Blue Lines, he continued his Attraction 50 Minutes, on the Scarlet Lines 25 Minutes, on the Orange coloured Lines 21 Minutes.

By these Experiments we see the Efficacy of Electricity upon Bodies suspended upon Lines of the same Substance, but of different Colours, and also that the Attraction continues much longer upon Silk than upon Yarn, and consequently Silk is the properest Body we can make use of to suspend those Bodies upon, to which we would communicate an Electricity : But of this Subject more when I shall reassume the Experiments concerning the Influence of Colours upon Electricity ; who am,

S I R,

*Charter House,
June 12, 1735.*

*Your's and the Society's most
Humble and obedient Servant,]*

Stephen Gray.